Chemical Analysis Report

CEN-DIST-2020-07-31-03

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Nut/Metals/Ecoli**
Request ID: **RQ-2020-07-13-42**
Customer: **CEN-DIST**
Project ID: **SMP**

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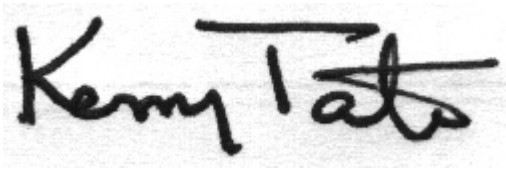
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 25-AUG-2020 09:30



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Minnie @ Center **Collection Date/Time: 07/30/2020 13:20**

Field ID: G2CE0108 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2187647	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P385471	
	EPA 300.0 Rev. 2.1	Chloride	35		mg Cl/L	P385888	
		Sulfate	1.9		mg SO4/L	P385893	
	SM 2120 B-2011	Color (true)	230		PCU	P385455	
	SM 2320 B-2011	Total Alkalinity	40		mg CaCO3/L	P385725	
	SM 2540 C-2011	TDS	137		mg/L	P386002	
	SM 2540 D-2011	TSS	6	I	mg/L	P385873	
	SM 4500 F-C-2011	Fluoride	0.066	I	mg F/L	P385566	
2187649	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P385486	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P385970	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P385533	
	EPA 365.1 Rev. 2.0	Total-P	0.074		mg P/L	P385644	
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P385840	
2187651	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P385499	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Marshall Lake @ Center **Collection Date/Time: 07/30/2020 11:20**

Field ID: G1CE0110 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2187648	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P385471	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P385888	
		Sulfate	14		mg SO4/L	P385893	
	SM 2120 B-2011	Color (true)	32	A	PCU	P385455	
	SM 2320 B-2011	Total Alkalinity	46	A	mg CaCO3/L	P385725	
	SM 2540 C-2011	TDS	103		mg/L	P386002	
	SM 2540 D-2011	TSS	3	I	mg/L	P385873	
	SM 4500 F-C-2011	Fluoride	0.075	I	mg F/L	P385566	
2187650	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P385486	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P385970	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P385533	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P385644	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P385840	
2187652	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P385499	
2187675	EPA 200.7 Rev. 4.4	Barium	9.5		ug/L	P385537	
		Calcium	20.7		mg/L	P385537	
		Iron	30	U	ug/L	P385537	
		Magnesium	3.71		mg/L	P385537	
		Potassium	3.9		mg/L	P385537	
		Sodium	8.6		mg/L	P385537	
		Zinc	5.0	U	ug/L	P385537	
	EPA 200.8 Rev. 5.4	Aluminum	7.4	I	ug/L	P385537	
		Antimony	0.18	I	ug/L	P385537	
		Arsenic	1.25		ug/L	P385537	
		Boron**	36.2		ug/L	P385537	
		Cadmium	0.020	U	ug/L	P385537	
		Chromium	0.40	U	ug/L	P385537	
		Copper	0.40	U	ug/L	P385537	
		Lead	0.20	U	ug/L	P385537	
		Nickel	0.50	U	ug/L	P385537	
		Selenium	0.20	U	ug/L	P385537	
		Silver	0.010	U	ug/L	P385537	
		Thallium	0.10	U	ug/L	P385537	
	SM 2340B	Hardness	67.0		mg/L	P385537	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385471

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385537

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385537

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385888

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385893

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385486

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385970

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385533

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385644

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385499

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B-2011
Batch ID: P385455

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P385725

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-2011
Batch ID: P386002

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P385873

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P385566

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P385840

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	110		P	85 - 115
Calcium	108		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	105		P	85 - 115
Sodium	101		P	85 - 115
Zinc	112		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.6		P	85 - 115
Antimony	97.3		P	85 - 115
Arsenic	97.4		P	85 - 115
Boron	103		P	85 - 115
Cadmium	97.3		P	85 - 115
Chromium	100		P	85 - 115
Copper	99.9		P	85 - 115
Lead	102		P	85 - 115
Nickel	98.9		P	85 - 115
Selenium	94.6		P	85 - 115
Silver	105		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385893

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	101		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.1		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385499

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	100		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P385455

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P385725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P385566

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P385840

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187620	Barium	102		P	80 - 120
2187620	Calcium	104		P	80 - 120
2187620	Iron	106		P	80 - 120
2187620	Magnesium	104		P	80 - 120
2187620	Sodium	103		P	80 - 120
2187620	Zinc	104		P	80 - 120
2187711	Barium	105	105	P/P	80 - 120
2187711	Calcium	108	108	P/P	80 - 120
2187711	Iron	106	108	P/P	80 - 120
2187711	Magnesium	108	109	P/P	80 - 120
2187711	Potassium	104	104	P/P	80 - 120
2187711	Sodium	102		P	80 - 120
2187711	Zinc	110	110	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187620	Aluminum	96.2		P	80 - 120
2187620	Antimony	100		P	80 - 120
2187620	Arsenic	99.5		P	80 - 120
2187620	Boron	103		P	80 - 120
2187620	Cadmium	98.4		P	80 - 120
2187620	Chromium	99.5		P	80 - 120
2187620	Copper	98.0		P	80 - 120
2187620	Lead	102		P	80 - 120
2187620	Nickel	97.2		P	80 - 120
2187620	Selenium	95.8		P	80 - 120
2187620	Silver	104		P	80 - 120
2187620	Thallium	105		P	80 - 120
2187711	Aluminum	93.3	94.0	P/P	80 - 120
2187711	Antimony	96.0	97.6	P/P	80 - 120
2187711	Arsenic	96.4	96.8	P/P	80 - 120
2187711	Boron	97.3	101	P/P	80 - 120
2187711	Cadmium	95.0	96.9	P/P	80 - 120
2187711	Chromium	99.4	100	P/P	80 - 120
2187711	Copper	99.3	100	P/P	80 - 120
2187711	Lead	101	102	P/P	80 - 120
2187711	Nickel	97.8	98.1	P/P	80 - 120
2187711	Selenium	92.6	92.8	P/P	80 - 120
2187711	Silver	102	104	P/P	80 - 120
2187711	Thallium	102	106	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187492	Chloride	100		P	90 - 110
2187631	Chloride	99.8		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385893

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187492	Sulfate	101		P	90 - 110
2187631	Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187695	Ammonia-N	100	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187623	Kjeldahl Nitrogen	104	87.7	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187650	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187649	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187652	O-Phosphate-P	98.4	97.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P385566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187648	Fluoride	99.7	99.1	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P385840

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187541	Organic Carbon	101	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187639	Turbidity	4.28	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187711	Barium	0.177	Spike	P	0 - 20
2187711	Calcium	0.0448	Spike	P	0 - 20
2187711	Iron	1.43	Spike	P	0 - 20
2187711	Magnesium	1.17	Spike	P	0 - 20
2187711	Potassium	0.461	Spike	P	0 - 20
2187711	Sodium	0.293	Spike	P	0 - 20
2187711	Zinc	0.0153	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187711	Aluminum	0.656	Spike	P	0 - 20
2187711	Antimony	1.70	Spike	P	0 - 20
2187711	Arsenic	0.286	Spike	P	0 - 20
2187711	Boron	2.69	Spike	P	0 - 20
2187711	Cadmium	1.93	Spike	P	0 - 20
2187711	Chromium	0.596	Spike	P	0 - 20
2187711	Copper	0.859	Spike	P	0 - 20
2187711	Lead	1.86	Spike	P	0 - 20
2187711	Nickel	0.296	Spike	P	0 - 20
2187711	Selenium	0.173	Spike	P	0 - 20
2187711	Silver	1.71	Spike	P	0 - 20
2187711	Thallium	3.08	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187631	Chloride	0.625	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385893

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187631	Sulfate	0.964	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187695	Ammonia-N	1.81	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187623	Kjeldahl Nitrogen	9.19	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187650	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187649	Total-P	0.583	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187652	O-Phosphate-P	0.714	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P385455

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187648	Color (true)	0.217	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P385725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187648	Total Alkalinity	1.26	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P386002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187632	TDS	6.73	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P385566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187648	Fluoride	0.519	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P385840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187541	Organic Carbon	2.05	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B-2011
Run ID: A100204
Included Lab Sample IDs: 2187647, 2187648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115
Color (true)	103	104	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100210
Included Lab Sample IDs: 2187647, 2187648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100213
Included Lab Sample IDs: 2187649, 2187650

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	99.2	P/P	90 - 110
Ammonia-N	99.2	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A100219
Included Lab Sample IDs: 2187651, 2187652

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.4	P/P	90 - 110
O-Phosphate-P	99.4	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100229
Included Lab Sample IDs: 2187649, 2187650

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A100241
Included Lab Sample IDs: 2187647, 2187648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	101	P/P	90 - 110
Fluoride	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100299
Included Lab Sample IDs: 2187675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.4	97.1	P/P	90 - 110
Arsenic	95.5	96.4	P/P	90 - 110
Boron	99.1	101	P/P	90 - 110
Cadmium	96.3	96.1	P/P	90 - 110
Chromium	95.4	96.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100299
Included Lab Sample IDs: 2187675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.5	97.7	P/P	90 - 110
Lead	98.4	98.9	P/P	90 - 110
Nickel	96.9	97.4	P/P	90 - 110
Selenium	94.0	96.9	P/P	90 - 110
Silver	101	102	P/P	90 - 110
Thallium	99.5	98.3	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100313
Included Lab Sample IDs: 2187647, 2187648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	100	P/P	90 - 110
Total Alkalinity	99.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A100314
Included Lab Sample IDs: 2187649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100325
Included Lab Sample IDs: 2187675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	90 - 110
Calcium	101	103	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	102	104	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100326
Included Lab Sample IDs: 2187675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	95.8	95.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A100334
Included Lab Sample IDs: 2187650

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.0	94.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A100374
Included Lab Sample IDs: 2187649, 2187650

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	104	P/P	90 - 110
Organic Carbon	104	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100386
Included Lab Sample IDs: 2187647, 2187648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100463
Included Lab Sample IDs: 2187649, 2187650

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.4	98.6	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						4.28	
EPA 200.7 Rev. 4.4	Barium	110	102	105	105			0.177
	Calcium	108	104	108	108			0.0448
	Iron	106	106	106	108			1.43
	Magnesium	107	104	108	109			1.17
	Potassium	105	104	104				0.461
	Sodium	101	103	102				0.293
	Zinc	112	104	110	110			0.0153
EPA 200.8 Rev. 5.4	Aluminum	94.6	93.3	94.0	96.2			0.656
	Antimony	97.3	96.0	97.6	100			1.70
	Arsenic	97.4	96.4	96.8	99.5			0.286
	Boron	103	97.3	101	103			2.69
	Cadmium	97.3	95.0	96.9	98.4			1.93
	Chromium	100	99.4	100	99.5			0.596
	Copper	99.9	99.3	100	98.0			0.859
	Lead	102	101	102	102			1.86
	Nickel	98.9	97.8	98.1	97.2			0.296
	Selenium	94.6	92.6	92.8	95.8			0.173
	Silver	105	102	104	104			1.71
	Thallium	104	102	106	105			3.08
EPA 300.0 Rev. 2.1	Chloride	99.2	99.8	100			0.625	
	Sulfate	101	99.6	101			0.964	
EPA 350.1 Rev. 2.0	Ammonia-N	101	100	98.2				1.81
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.1	104	87.7				9.19
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	102				0.494
EPA 365.1 Rev. 2.0	Total-P	104	106	106				0.583
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	98.4	97.7				0.714
SM 2120 B-2011	Color (true)	101					0.217	
SM 2320 B-2011	Total Alkalinity	103					1.26	
SM 2540 C-2011	TDS						6.73	
SM 4500 F-C-2011	Fluoride	101	99.7	99.1				0.519
SM 5310 B-2011	Organic Carbon	100	101	103				2.05

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2187647, 2187648
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2187675
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2187675
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2187647, 2187648
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2187647, 2187648
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2187649, 2187650
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2187649, 2187650
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2187649, 2187650
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2187649, 2187650
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2187651, 2187652
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2187647, 2187648
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2187647, 2187648
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2187675
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2187647, 2187648

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2187647, 2187648
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2187647, 2187648
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2187649, 2187650

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	07/31/2020			07/31/2020 15:33	Blanca Fach	2187647, 2187648
EPA 200.7 Rev. 4.4	07/31/2020	08/03/2020 14:00	Elliott D. Healy	08/06/2020 16:15	Betina Topolski	2187675
EPA 200.8 Rev. 5.4	07/31/2020	08/03/2020 14:00	Elliott D. Healy	08/05/2020 16:22	Alexander Thompson	2187675
	07/31/2020	08/03/2020 14:00	Elliott D. Healy	08/07/2020 02:30	Alexander Thompson	2187675
EPA 300.0 Rev. 2.1	07/31/2020			08/08/2020 02:40	Julia Storbeck	2187647
	07/31/2020			08/08/2020 02:52	Julia Storbeck	2187648
EPA 350.1 Rev. 2.0	07/31/2020			08/02/2020 14:16	Ping Hua	2187649
	07/31/2020			08/02/2020 14:24	Ping Hua	2187650
EPA 351.2 Rev. 2.0	07/31/2020	08/13/2020 10:15	Sima Feizi	08/14/2020 10:58	Jhamieka S. Greenwood	2187649
	07/31/2020	08/13/2020 10:15	Sima Feizi	08/14/2020 11:00	Jhamieka S. Greenwood	2187650
EPA 353.2 Rev. 2.0	07/31/2020			08/03/2020 10:49	Beverly Y. Sanders	2187650
	07/31/2020			08/03/2020 10:59	Beverly Y. Sanders	2187649
EPA 365.1 Rev. 2.0	07/31/2020	08/05/2020 10:35	Lipi Saha	08/06/2020 09:13	Benjamin T. Nordmann	2187649
	07/31/2020	08/05/2020 10:35	Lipi Saha	08/07/2020 09:26	Lipi Saha	2187650
EPA 365.1 Rev. 2.0 dissolved	07/31/2020			07/31/2020 15:52	Virginia P. Brown	2187652
	07/31/2020			07/31/2020 16:33	Virginia P. Brown	2187651
SM 2120 B-2011	07/31/2020			07/31/2020 15:16	Benjamin T. Nordmann	2187648
	07/31/2020			07/31/2020 15:28	Benjamin T. Nordmann	2187647
SM 2320 B-2011	07/31/2020			08/05/2020 18:18	Dale L. Simmons	2187648
	07/31/2020			08/05/2020 20:56	Dale L. Simmons	2187647
SM 2340B	07/31/2020			08/06/2020 16:15	Betina Topolski	2187675
SM 2540 C-2011	07/31/2020			08/05/2020 15:06	Yijie Li	2187647, 2187648
SM 2540 D-2011	07/31/2020			08/05/2020 15:06	Yijie Li	2187647, 2187648
SM 4500 F-C-2011	07/31/2020			08/03/2020 17:28	Dale L. Simmons	2187648
	07/31/2020			08/03/2020 21:27	Dale L. Simmons	2187647
SM 5310 B-2011	07/31/2020			08/07/2020 21:33	David Boose	2187649
	07/31/2020			08/07/2020 22:09	David Boose	2187650